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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,935	12/17/2003	Michael Carney	031383-9097-00	8479

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EXAMINER

KIM, TAE JUN

ART UNIT PAPER NUMBER

3746

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Tate

Office Action Summary	Application No.	Applicant(s)	
	10/738,935	CARNEY, MICHAEL	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/03, 6/05, 7/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I in the reply filed on 09/19/2005 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Bell, III (3,490,746) or Hagemeister (3,703,076) in view of Araki (3,440,038) and either Stabuli et al (202/0136659) or Holko (4,333,670). Bell, III teach a power transfer assembly comprising: a power turbine 34; a gear shaft 45; wherein the power turbine and gear shaft each have axes of symmetry that are collinear with each other, and wherein the power transfer assembly rotates about an axis of rotation that is substantially collinear with the axes of symmetry; the gear shaft has a pinion/sun gear 53 integrally formed therein; the gear shaft includes at least one bearing surface illustrated but not numbered. Hagemeister teaches a power transfer assembly comprising: a power turbine 7; a gear shaft 8; wherein the power turbine and gear shaft each have axes of symmetry that are collinear with each other, and wherein the power transfer assembly rotates about an axis

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of rotation that is substantially collinear with the axes of symmetry; the gear shaft has a pinion gear 13 integrally formed therein (alternately, it is obvious to make integral); the gear shaft includes at least one bearing surface 11. These references do not teach the power turbine being of Ni alloy, the gearshaft being low carbon and a transition portion between and welded to each of the power turbine and gearshaft. Araki teaches it is old and well known in the art to make the power turbine 1 (fig. 5) of a nickel alloy steel (col. 2, lines 53+) and the shaft is of low alloy carburized steel (col. 3, lines 14+) and even inertia/friction welding thereof (col. 4, lines 15+). Stabuli et al teach a turbine rotor having a nickel based alloy 12, a low carbon steel and a transition zone welded 14 and 15 between the two where the transition zone facilitates the connection between the two different materials and aids in an overall lower cost structure (page 1, col. 1, end of paragraph 0002). Holko teaches a transition joint between a low alloy carbon steel and nickel alloy steel including inertial welding the transition portion where the transition zone facilitates the connection between the two different materials and aids in an overall lower cost structure. It would have been obvious to one of ordinary skill in the art to employ the materials of Araki and Stabuli with a transition zone to facilitate an overall low cost structure with good structural characteristics. As for the inertial/friction weld, it would have been obvious to one of ordinary skill in the art to employ as taught by Stabuli, in order to employ a strong weld. As for using an electron beam weld, this is old and well known in the art (see e.g. JP 57-77078) for welding turbine parts and it would have been obvious to employ to use a well known process of manufacture. As for the

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power turbine being a radial turbine, radial turbines are well known equivalents in the art to axial turbines and would have been obvious to employ for their more compact arrangement (see e.g. Wood et al). As for the various materials including Inconel 713, 9310 steel and 4140 steel and the various MIL and AMS standards, these are deemed within the ordinary skill in the art as using well known materials in the art for these components and for ensuring the materials are suitable for their intended purpose.

4. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meister et al (6,363,706) in view of Araki (3,440,038) and either Stabuli et al (202/0136659) or Holko (4,333,670) and optionally in view of Wood et al (3,188,479).

Meister et al teach a microturbine engine comprising: a recuperator having a hot gas flow path and a cool gas flow path; a compressor 13 providing a flow of compressed gas to the cool gas flow path of the recuperator 21, the compressed gas being heated within the recuperator; a source of fuel providing a flow of fuel; a combustor receiving the heated flow of compressed gas from the recuperator and the flow of fuel from the source of fuel, and combusting a mixture of compressed gas and fuel to produce a flow of hot gas; a radial flow turbine 25 receiving the flow of hot gas from the combustor and discharging a flow of exhaust gas; a power transfer assembly 27 which drives a power train (gearshaft) or electrical generator. Meister et al do not teach the turbine wheel constructed of a nickel alloy, a gear shaft constructed of a low-carbon carburized gear material and having a pinion gear integrally formed therein, and a transition portion between and welded to each of the turbine wheel and gear shaft, a bull gear in meshing engagement with the

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pinion gear; and an electric generator generating electricity in response to rotation of the bull gear. Araki teaches it is old and well known in the art to make the power turbine 1 (fig. 5) of a nickel alloy steel (col. 2, lines 53+) and the shaft is of low alloy carburized steel (col. 3, lines 14+) and even inertia/friction welding thereof (col. 4, lines 15+).

Stabuli et al teach a turbine rotor having a nickel based alloy 12, a low carbon steel and a transition zone welded 14 and 15 between the two where the transition zone facilitates the connection between the two different materials and aids in an overall lower cost structure (page 1, col. 1, end of paragraph 0002). Holko teaches a transition joint between a low alloy carbon steel and nickel alloy steel including inertial welding the transition portion where the transition zone facilitates the connection between the two different materials and aids in an overall lower cost structure. It would have been obvious to one of ordinary skill in the art to employ the materials of Araki and Stabuli with a transition zone to facilitate an overall low cost structure with good structural characteristics. As for the inertial/friction weld, it would have been obvious to one of ordinary skill in the art to employ as taught by Stabuli, in order to employ a strong weld. As for using an electron beam weld, this is old and well known in the art (see e.g. JP 57-77078) for welding turbine parts and it would have been obvious to employ to use a well known process of manufacture. As for the various materials including Inconel 713, 9310 steel and 4140 steel and the various MIL and AMS standards, these are deemed within the ordinary skill in the art as using well known materials in the art for these components and for ensuring the materials are suitable for their intended purpose. As for the bull gear, Wood teaches

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the drive arrangement where the turbine 12 drives a shaft with integral pinion 31 which drives a bull gear 32 which drives the electric generator 11. It would have been obvious to one of ordinary skill in the art to employ the step down gearing arrangement of Wood, as a well known technique to match the turbine speed to an electric generator speed. As for the speed being 44,300 rpm this is regarded as an obvious matter of finding the workable ranges in the art. The use of first and second bearings is also old and well known in the art for the gearshaft as taught by Hagemeister with bearings 10 and 11. It would have been obvious to one of ordinary skill in the art to employ multiple bearings as an obvious matter of providing sufficient rotational support.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are

571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone

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number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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